Table of Contents

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FINAL REPORT

AN EXAMINATION OF TWO METHODOLOGICAL ISSUES OF IMPORTANCE TO THE ANALYSIS OF SERIAL MULTIPLE PROGRAM PARTICIPATION

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Table of Contents

FNS PAPER SERIES ON MULTIPLE PROGRAM PARTICIPATION

This is one in a series of working papers commissioned by the Office of Analysis and Evaluation of the United States Department of Agriculture's Food and Nutrition Service to review the participation of the U.S. low-income population in multiple cash and in-kind assistance programs. This series consists of: (1) a reference handbook that summarizes regulations governing nutrition assistance programs and major other programs and also provides program data on participation and benefits; (2) a basic primer that shows how the interaction and sequencing of assistance programs affect the benefits provided by those programs both individually and cumulatively; (3) reports on empirical analyses of participation by individuals and households in multiple assistance programs, based upon several cross-sectional and longitudinal data bases. These papers reflect preparatory work for the analysis of data from the Survey of Income and Program Participation, as well as original empirical analyses of SIPP data.

Table of Contents

PREFACE

This report uses data from the Survey of Income and Program Participation 1984 (Preliminary) Longitudinal Research File, which was released by the Census Bureau for research to improve the understanding and analysis of SIPP data. The data on the file are preliminary and should be analyzed and interpreted with caution. At the time the file was created, the Census Bureau was still exploring certain unresolved technical and methodological issues associated with the creation of this longitudinal data set. The Census Bureau does not approve or endorse the use of these data for official estimates.

CONTENTS

Section		Page
EXECUTIVE SUMMARY		v
A.	SIPP LONGITUDINAL DATA	2
B.	THE APPROPRIATE TIME UNIT	7
	1. Review of the Literature	8
	2. One-Month and Four-Month Program Transitions	10
C.	PART-YEAR HOUSEHOLDS	16
	1. Number of the Part-Year Households	18
	2. Methods for Including Part-Year Households in the Analysis	22
	3. Incorporating Information on Antecedent Households in the Analysis	29
D.	SUMMARY AND RECOMMENDATIONS	38
	1. Appropriate Time Unit	38
	2. Part-Year Households	40
	3. Recommendations	42
REFERENCES		44
APPENDIX A: SUPPLEMENTAL TABLES		

Table of Contents

LIST OF TABLES

Table		Page
1	PROGRAMS INCLUDED IN THE ANALYSIS AND THE PERIODICITY OF INFORMATION COLLECTED IN SIPP	6
2	TESTS OF SIGNIFICANCE FOR DIFFERENCES IN PROGRAM PARTICIPATION STATUS IN THE INITIAL PERIOD AND IN THE PERCENTAGE OF HOUSEHOLDS WITH PROGRAM TRANSITIONS OVER A YEAR FOR FULL-YEAR PROGRAM PARTICIPANT HOUSEHOLDS, USING THE MONTHLY AND FOUR-MONTH TIME UNITS, 1983/1984	12
3	SUMMARY MEASURES OF PROGRAM TRANSITIONS OVER A YEAR FOR FULL-YEAR PROGRAM PARTICIPANT HOUSEHOLDS, USING THE MONTHLY AND FOUR-MONTH TIME UNITS, 1983/1984	13
4	THE NUMBER OF HOUSEHOLDS CONTINUING, DISSOLVING, AND FORMING OVER THE YEAR FOR ALL PROGRAM PARTICIPANT HOUSEHOLDS, 1983/1984	19
5	THE LENGTH OF TIME THAT PART-YEAR HOUSEHOLDS ARE OBSERVED TO EXIST FOR ALL PROGRAM PARTICIPANT HOUSEHOLDS, 1983/1984	21
6	COMPARISON OF PROGRAM PARTICIPATION STATUS OF PROGRAM PARTICIPANT HOUSEHOLDS IN THE INITIAL MONTH UNDER DIFFERENT TREATMENTS OF PART-YEAR HOUSEHOLDS, USING THE MONTHLY TIME UNIT, 1983/1984	24
7	COMPARISON OF THE PERCENTAGE OF HOUSEHOLDS WITH PROGRAM TRANSITIONS FOR PROGRAM PARTICIPANT HOUSEHOLDS UNDER DIFFERENT TREATMENTS OF PART-YEAR HOUSEHOLDS USING THE MONTHLY TIME UNIT, 1983/1984	25
8	COMPARISON OF PROGRAM TURNOVER RATES FOR PROGRAM PARTICIPANT HOUSEHOLDS UNDER DIFFERENT TREATMENTS OF PART-YEAR HOUSEHOLDS, USING THE MONTHLY TIME UNIT, 1983/1984	27
9	COMPARISON OF AVERAGE PROGRAM EXIT RATES OVER THE YEAR FOR PROGRAM PARTICIPANT HOUSEHOLDS UNDER DIFFERENT TREATMENTS OF PART-YEAR HOUSEHOLDS, USING THE MONTHLY TIME UNIT, 1983/1984	28
10	COMPARISON OF PROGRAM PARTICIPATION BY NEWLY FORMED HOUSEHOLDS IN THEIR INITIAL MONTH WITH THE PROGRAM PARTICIPATION OF THEIR ANTECEDENT HOUSEHOLD IN THE PRIOR MONTH, 1983/1984	33
11	AN ILLUSTRATION OF THE POTENTIAL EFFECT OF NEWLY FORMED HOUSEHOLDS CONTINUING THE PARTICIPATION PATTERNS OF THEIR ANTECEDENT HOUSEHOLD	37

Table of Contents

EXECUTIVE SUMMARY

Serial analysis of multiple program participation is intended to illuminate the extent to which participation in assistance programs changes over time. Such analyses are important to our understanding of the persistence of household dependence on particular assistance programs (and program combinations) and the presence of causal links not only among assistance programs, but also between such programs and self-sufficiency. The Survey of Income and Program Participation (SIPP), with its month-to-month information on participation in a large number of assistance programs has enormous promise for the analysis of serial multiple program participation. However, in order to realize the full potential of SIPP for such analyses, there are a number of complex methodological issues to be resolved. In this study, we have used the 1984 SIPP Preliminary Longitudinal Research File to address two such issues: (1) the appropriate time unit for the analysis of program transitions using SIPP and (2) alternative methods to account for part-year households in analyzing serial program participation.

Appropriate Time Unit

Important information on the dynamics of serial multiple program participation is lost if, as indicated in several studies, the reported transitions in program recipiency in SIPP occur more frequently between successive months that are in different waves (or rounds of interviewing) than between successive months within a single wave. This bias in the timing of transitions toward the "seam" of the survey suggests that the month-to-month information on changes in program participation in SIPP may not be accurate and, consequently, an analysis of the changes in monthly program participation may not be warranted. In addressing this issue, this report compares the profile of transitions in program participation obtained when using the monthly SIPP data to that obtained under the four-month wave period.

Our findings show that there is information on serial program participation available from SIPP using the monthly time unit that is missed when the analysis utilizes the longer time unit. In particular, the four-month time unit will overstate the scope and stability of serial multiple program participation relative to the monthly time unit. This occurs because any program in which the household participates in any month during the wave is included in the multiple program combination of the four-month period, and all within-wave transitions are ignored.

The existence of intra-wave transitions in SIPP and the importance of the monthly time unit to program administration suggest that the abandonment of the monthly time unit for analyses of program participation using SIPP is not appropriate. However, given the evidence from other studies that there may be different degrees of bias across the programs in the timing of transitions, the results obtained when using the monthly time unit should be viewed as preliminary.

Part-Year Households

The use of the household as the unit of analysis in longitudinal studies, while useful in addressing some research questions, creates analytic problems since households change composition, form, and dissolve over time. As there is no established standard for what constitutes a household over time, relatively arbitrary assumptions must be made to define the longitudinal household unit. These definitions yield a group of households that exist for only part of the period. This report addresses two problems associated with such part-year households.

Counting Part-Year Households. Since all households do not exist for the full time period, standard summary measures of household behavior over a fixed period of time are problematic as they do not adjust for the differences in the length of time over which that behavior is observed. In this report, we compare several alternative methods for incorporating part-year households into a longitudinal analysis. The methods considered include:

1. Treating full-year and part-year program participant households separately

2. Analyzing all program participant households without regard to the length of time over which they exist, and

3. Using time-weighted program participant households, where the time-weights are based on the proportion of the year that the household exists.

Our findings indicate that part-year households form an important component of the program participant households that exist over the year and that the inclusion of such households in the analysis of serial program participation has a significant impact on the profile that is obtained. Time-weighting, by adjusting the measures of serial program participation for the length of time that the household exists, provides an effective middle ground between approaches that ignore part-year households and those that weight part-year and full-year households equally.

Prior History of Newly-Formed Households. One criticism of the household as the unit of analysis in longitudinal studies is that information on the antecedent household is ignored when a new household forms. Since program assistance units do not necessarily correspond to the longitudinal household, the household-level analysis may indicate greater turnover in program participation than is supported by administrative records. In comparing the program participation status of newly-formed households with their antecedent households, we explore the extent to which the Census Bureau longitudinal household definition may introduce artificial program entry into the profile of serial program participation.

Our work suggests that there may be a great deal of continuity in program participation as households dissolve and form that is not captured in the

standard household-level analysis. However, additional work is needed to determine more clearly the relationship between the longitudinal household definition and the definitions of the program units. Until that work is completed, care should be taken in using the findings from a household-based analysis of serial program participation as an approximation to participation over time from the perspective of program administration.

Recommendations for Future Substantive Research

Based on the findings of this study, we make the following recommendations with respect to future substantive research on serial multiple program participation:

- SIPP-based research on serial multiple program participation should move forward using the monthly time unit, with the limitations of the SIPP data clearly noted by the analyst.
- Household-based analyses of serial multiple program participation should incorporate both full-year and part-year households, with time-weighting used to adjust for the differences in the time periods for which households are observed.
- If the particular research questions that are being addressed permit, units of observation that do not generate part-period units (e.g., individuals or individuals with the family or household characteristics incorporated as attributes of the individual) should be utilized.

Recommendations for Future Methodological Research

In addition to providing direction for future substantive research on serial multiple program participation, this report highlights the need for additional methodological work. In particular, we identify two areas for such research:

1. Research is needed to determine the sensitivity of measures of serial multiple program participation (particularly, measures of sequential program entry and exit) to differences in the biases in the timing of transitions in program participation across the assistance programs.

2. Household-based measures of serial multiple program participation may be sensitive to the particular longitudinal household definition that is used. An important direction for future research will be the examination of the relationship between the Census Bureau's longitudinal household definition and the definition of the assistance unit under the different programs.

Table of Contents

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Table of Contents

AN EXAMINATION OF TWO METHODOLOGICAL ISSUES OF IMPORTANCE TO THE ANALYSIS OF SERIAL MULTIPLE PROGRAM PARTICIPATION

Serial analysis of multiple program participation is intended to illuminate the extent to which participation in assistance programs changes over time. Such analyses are important to our understanding of the persistence of household dependence on particular assistance programs (and program combinations) and the presence of causal links not only among assistance programs, but also between such programs and self-sufficiency. With the availability of the longitudinal data from the Survey of Income and Program Participation (SIPP), the actual behavior of households and individuals can be traced over time in terms of their monthly patterns of household composition, income, and program eligibility and participation.[1] Because of this month-to-month information on the participation of individuals and households in a large number of assistance programs, SIPP has enormous promise for analyses of the patterns of multiple program participation over time. However, in order to realize the full potential of SIPP for such analyses, several important methodological issues must be resolved. This report addresses two such issues that are fundamental to future research on serial multiple program participation:

1. The appropriate time unit for using SIPP to analyze program transitions

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[1]Although SIPP is an excellent data source for program analyses, there are significant limitations to the examination of program eligibility over time. Much of the information needed to determine eligibility is not collected for every month, and some important pieces of information are not collected in SIPP at all.

2. Alternative methods to account for part-year households (that is, households that exist for less than the full observation period) in analyzing serial program participation.[2]

The remainder of the report consists of four sections. Section A briefly describes SIPP and the longitudinal data used in the analyses. Sections B and C present our analyses of the appropriate time unit and the treatment of part-year households, respectively. Section D summarizes our recommendations about these issues for future research on serial multiple program participation based on SIPP.

A. SIPP LONGITUDINAL DATA

SIPP is a nationally representative longitudinal survey of adults that provides detailed information on intra-year fluctuations in household and individual income, poverty status, program participation, and wealth. The sample of adults included in a SIPP panel[3] contains persons ages 15 years and older who are residing in a cross-section sample of addresses as of the first interview. This initial sample of adults for each SIPP panel is divided into four groups of equal size (called "rotation" groups). One round (or wave) of the survey is administered to the rotation groups on a staggered basis over four successive months. For each wave of the survey, the individuals who are interviewed include the initial sample of adults and all other adults with

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[2]Other methodological issues that arise in analyses of serial multiple program participation include: longitudinal sample design and weighting, longitudinal imputation of missing data, longitudinal editing, longitudinal household definitions, and the time frame of the survey (i.e., missing information on the beginning and/or end of a period of program participation).

[3]New samples of households (or panels) are introduced periodically. Each panel is followed for approximately two and a half years.

whom those initial sample members reside at the time of the interview. Each survey wave obtains information on the individual and the individual's household (including information on children younger than 15 years of age) for the four months preceding the interview. The information that is collected is quite extensive, covering monthly cash and in-kind income from over fifty different sources, weekly labor force activities, and the monthly composition of the household, family, and program assistance units. For the first SIPP panel, the 1984 panel, eight or nine waves of the survey were administered (covering a period of about two and a half years).[4]

This study is based on an extract from the enhanced version of the 1984 SIPP Preliminary Longitudinal Research File prepared by the Census Bureau for the Food and Nutrition Service (FNS) of the U.S. Department of Agriculture. This file covers the first three rounds of interviews of the 1984 SIPP panel, providing twelve months of data. Because of the staggered interviewing schedule, these twelve months do not correspond to the same calendar months for all four rotation groups. The 12-month period for the first rotation group begins in June 1983, and the 12-month period for the fourth rotation group begins in September 1983.

This longitudinal file contains preliminary longitudinal edits for consistency over time, longitudinal imputations for item and unit nonresponse, and longitudinal weighting. The 12-month file was made available to the research community prior to the release of the full two-and-a-half-year

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[4]In the 1984 panel, two waves of the survey were "short waves" -- that is, they were administered only to three of the four rotation groups. Consequently, half of the 1984 panel was interviewed eight times and half nine times.

longitudinal file in the expectation that research on the smaller file would improve future longitudinal products.

The initial 1984 panel sample consisted of approximately 53,734 individuals who were interviewed in Wave 1. The longitudinal sample consists of original sample adults who were successfully interviewed for as long as they remained within the sample universe, together with the children who were residing with them as of the first interview. The longitudinal sample for the 12-month file consists of 47,437 individuals. Longitudinal weights were assigned to these individuals and their households to compensate for the loss of sample members through attrition. These weights were adjusted so that selected characteristics of the sample corresponded to independent control estimates established as of a fixed point in time. Hence, the longitudinal sample provides a picture of the dynamic characteristics of a cross-section sample of the population, rather than of the population as a whole. In particular, since there is no provision in SIPP for adding new sample cases formed over the survey period by persons who enter the SIPP universe as immigrants, the longitudinal sample undercounts part-year households.[5]

In addition to information on the individuals included in the longitudinal sample, the longitudinal file also contains the information that was obtained from other, non-longitudinal sample members who were interviewed over the course of the survey because they were residing with a sample member.

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[5]It is also likely that the SIPP longitudinal sample undercounts part-year households because of the increased likelihood of survey attrition by individuals who undergo a change in marital status or household composition. In a study of attrition in the first five waves of the 1984 SIPP panel, Short and McArthur (1987) found evidence which suggested that persons who left the sample were significantly more likely to have experienced a household change than were those persons who stayed in the sample.

Thus, it is possible to construct measures of household characteristics that include information on all members of the household, rather than just the household members included in the longitudinal file.

The definition of the longitudinal household used in this analysis is based on the current Census Bureau definition. Under this definition, a household is assumed to continue from one month to the next as long as the household's reference person (i.e., the person who owns or is renting the house) and his or her family arrangement (e.g., married-couple household, single male householder, or single female householder) remains the same. Within the wide spectrum of possible definition (see Citro et al., 1987), this longitudinal household definition is among those which emphasize the continuity of the household.

This analysis focuses on a broad spectrum of cash and in-kind assistance programs, as listed in Table 1. In examining participation in these programs over time, one should note two caveats about the information on serial program participation that is available from SIPP. First, as noted in the table, information on participation in two programs--Medicare and LIHEAP--is sought only once for all four months of the survey wave, rather than for each individual month in the wave. Consequently, information on monthly participation in those programs must be approximated.[6] Second, information on

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[6]Because information on the National School Lunch Program (NSLP) and the School Breakfast Program (SBP) is sought only once for all four months in the survey wave and because, in preparing the analysis file for this research, the variables for NSLP and SBP participation were edited to reflect the fact that the programs are not available in the summer months, we did not include those programs in the body of this report. Selected information on participation in these programs is reported in Appendix Table A.1.

TABLE 1

PROGRAMS INCLUDED IN THE ANALYSIS AND THE PERIODICITY OF INFORMATION COLLECTED IN SIPP

Program	Acronym	Periodicity of Information Collected in SIPP: Month	Wave	Initial Survey
Social Insurance Programs				
Old Age, Survivors, and Disability Insurance	OASDI	X		
Unemployment Insurance	UI	X		
Medicare			X	
Needs-Tested Programs				
Aid to Families with Dependent Children, General Assistance, and other cash welfare	AFDC+	X		
Supplemental Security Income	SSI	X		
Food Stamp Program	FSP	X		
Special Supplemental Food Program for Women, Infants, and Children	WIC	X		
Medicaid		X		
Lower-Income Housing Assistance and Low-Rent Public Housing				X[a]
Low-Income Home Energy Assistance Program	LIHEAP		X	

[a] Information on subsidized and public housing assistance is also sought in the first interview following a move to a new address.

participation in the housing assistance programs is collected only during the first survey wave; for households that move, it is collected during the first interview following the change of address. Thus, the ability to observe transitions in participation in these programs is correlated with the ability to follow households that move during the course of the survey.[7]

B. THE APPROPRIATE TIME UNIT

The major advantage of SIPP for analyzing serial multiple program participation is that it contains detailed monthly information on variables pertaining to program eligibility and participation. Important information on the dynamics of program participation is lost if, as indicated in several studies, transitions in program benefit receipt in SIPP occur more frequently between successive months that are in different waves than between successive months within a single wave. This bias in reported transitions toward the "seam" of the survey suggests that the month-to-month transitions in program participation may not be accurate, and, consequently, that a detailed analysis of monthly program transitions may not be warranted.[8] In this section, we explore the scope of the bias in reported transitions for a number of assistance programs. Specifically, we compare the pattern of program transitions

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[7]In their analysis of attrition from the first five waves of the 1984 SIPP panel, Short and McArthur (1987) found that about 13 percent of the sample members who attrited from the survey could not be interviewed because they had moved to an unknown new address. Consequently, for such households, any transitions onto or off of housing assistance would be missed.

[8]This "seam" problem is not unique to SIPP. Similar problems with the reported timing of transitions have occurred in the Current Population Survey (Hogue, 1985) and the Panel Study of Income Dynamics (Hill, 1988).

using the monthly data with the pattern using the four-month wave period. If the bias in the timing of transitions toward the seam of the survey is so severe that it leads to equivalent profiles under the two time units, we will take that as evidence that no additional information is to be gained from the monthly time unit that is not already captured by the four-month wave period. This section begins with a brief overview of the existing literature that addresses the timing of reported transitions in SIPP.

1. Review of the Literature

Research on the timing of month-to-month transitions in program participation in SIPP has indicated that such transitions are much more likely to occur between months that span survey waves than between months within an individual wave (Burkhead and Coder, 1985; and Coder, 1988).[9] However, the severity of the misreporting problem appears to vary with different programs. Work at the Census Bureau which compared SIPP estimates with administrative records for FSP participation suggests that the volume of transitions over a 12-month period shows no evidence of bias, but that the reported timing of those transitions across the within-wave months does. With respect to AFDC participation, there is some indication of bias in both the reported volume of transitions (too few transitions reported in SIPP) and the reported timing of those transitions across the individual months.[10] Finally, comparisons of SSI participation reported in SIPP with program administrative records provides

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[9]This section draws from a review of research on the quality of the data by Singh, Weidman, and Shapiro (1988).

[10]While tests of the significance of the differences in the volume of

clear evidence of significant bias in both the volume and timing of transitions, with SIPP indicating a greater volume of transitions, and those transitions occurring predominantly at the survey seam. It is hypothesized that the greater volume of transitions in SSI receipt observed in SIPP relative to administrative records is due to confusion between types of benefits (e.g., confusion between Social Security and SSI), leading to changes from one wave to the next in the program from which benefits are reported as having been received (Singh, Weidman, and Shapiro, 1988).

While not involving a comparison with administrative records, Hill (1988) compared the timing of reported transitions relative to the survey seam in SIPP and the Panel Study of Income Dynamics for two programs--UI and the FSP. The dominance of reported transitions at the survey seam over within-wave transitions was observed to be strongest for the FSP in both surveys. This finding led Hill to hypothesize that differences across programs in the dominance of transitions that are reported to occur between waves--indicating differences in the extent of bias in the timing of transitions--may be due to:

- The size of the program assistance unit (individual-specific benefits appear to be recalled more accurately in surveys than are benefits provided to larger recipiency units)
- The average duration of benefit receipt (programs with shorter spells on average are subject to more frequent transitions, and, thus, the actual timing of transitions may be easier to recall).

The bias toward the seam has been attributed to issues associated with both the design and the processing of the survey and to issues associated with the survey respondents. The survey-related issues include the following: questionnaire wording/design, interviewer coding/data entry, imputation, and

interviewer turnover during the course of the survey. The latter category includes the following: the ability to recall events accurately for the early months of the four month reference period, a change from a self-respondent to a proxy respondent for some survey waves, learning from previous interviews, and demographic characteristics (Weidman, 1986). Regardless of the causes, the bias in the reported timing of transitions may have severe implications for analyses of serial multiple program participation.

2. One-Month and Four-Month Program Transitions

In examining the pattern of serial program participation using the monthly and the four-month time units, we compare the distribution of households by the number of program transitions, by program turnover rates, and by average program exit rates to determine the degree to which the profile of serial program participation changes when one moves from the monthly to the four-month time unit.[11] In order to avoid the problems associated with analyzing part-year households, we limit this comparison to those households that existed for the entire year. We also limit the sample to households that are observed to participate in at least one of the twelve programs being studied at some point during the year. We focus on the program participant households, since that population, particularly the subset of that population that receives food stamps, is frequently the focus of study by FNS. Finally, given that the objective of this study is to examine two methodological issues

[11]We do not consider average program entry rates in this analysis, since determining eligibility for each of the programs--an important step in deriving program entry rates--is beyond the scope of this task. An alternative measure of program entry, average program entry rates for the full sample (i.e., the sample of program eligibles and ineligibles), was judged to add little to the substance of this report.

rather than analyze serial multiple program participation per se, we focus primarily on participation over time in the individual programs.

As shown in Table 2, the profiles of program participation that are obtained for many of the programs included in the analysis differ significantly under the monthly and four-month time units.[12] While, the initial profile of program participation is quite similar under the monthly and four-month time units (with the exception of UI), the frequency of transitions in that participation profile over the year is significantly greater under the monthly time unit for the majority of the programs. Significant differences in the percentages of households who undergo one or more transitions in their program participation status over the course of the year are observed between the monthly and four-month time units for OASDI, UI, AFDC and other cash welfare, the FSP, WIC, and Medicaid.[13] The differences in the percentages of households with transitions range from about one percentage point for OASDI participants to about 18 percentage points for UI participants.

These differences in the serial program participation profiles obtained under the monthly and four-month time units can also be seen in the summary measures of program transitions reported in Table 3. Program turnover rates--the ratio of the number of households that ever participated in the

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[12]We used a significance level of α=.05 (two-tailed test) in all hypothesis tests reported in the text.

[13]These percentages are based on the households that were ever participating in the program over the course of the year, rather than on those that participated in the initial month, so as to base both the monthly and four-month measures on the same set of households. In this way, we can separate the impact of the choice of time unit on the measure of transitions in program participation from the impact on the measure of initial program participation status. It should be noted that, for those households that are not initially participating in a program, the first transition to participation is not included in the count of "one or more transitions."

Table of Contents

TABLE 2

TESTS OF SIGNIFICANCE FOR DIFFERENCES IN PROGRAM PARTICIPATION STATUS IN THE INITIAL PERIOD AND IN THE PERCENTAGE OF HOUSEHOLDS WITH PROGRAM TRANSITIONS OVER A YEAR FOR FULL-YEAR PROGRAM PARTICIPANT HOUSEHOLDS, USING THE MONTHLY AND FOUR-MONTH TIME UNITS, 1983/1984
(Weighted)

Program	Percent of Households That Are Program Participants in Initial Time Period		Test of Difference in Proportion of Households Participating in Initial Period for Ever-On Households (t-statistic)	Percent of Ever-On Households with One or More Transitions in Program Participation		Test of Difference in Proportion of Households with Transitions in Program Participation for Ever-On Households (t-statistic)
	Month	Wave		Month	Wave	
One or More Programs	80.6	87.9	-12.97**	21.3	13.9	12.55*
OASDI	54.1	54.9	-0.86	3.2	2.1	3.31**
UI	7.5	11.0	-3.47**	81.1	62.3	11.72**
Medicare	49.0	49.0	0.00	2.3	2.1	0.69
AFDC+	8.5	9.3	-0.61	27.5	18.4	4.73**
SSI	6.6	6.8	-0.17	10.0	7.3	1.69
FSP	14.7	16.7	-1.62	33.2	23.6	6.11**
WIC	2.4	3.0	-0.46	44.3	31.1	3.67**
Medicaid	17.4	18.1	-0.53	21.3	16.1	4.00**
Housing Assistance	8.6	8.6	0.00	8.0	6.5	1.12
LIHEAP	3.3	3.3	0.00	60.7	59.1	0.80
Two or More Programs	61.0	65.9	-5.57**	15.0	13.9	1.71
Sample Size (Thousands)	40,304					

SOURCE: 1984 SIPP Preliminary Longitudinal Research File

NOTE: Program participant households include all households that were participating in any of the programs studied at any time during the year.

*(**) Significant at the a = .05 (a = .01) level, two-tailed test.

Table of Contents

TABLE 3

SUMMARY MEASURES OF PROGRAM TRANSITIONS OVER A YEAR FOR FULL-YEAR PROGRAM PARTICIPANT HOUSEHOLDS, USING THE MONTHLY AND FOUR-MONTH TIME UNITS, 1983/1984
(Weighted)

Program	Ratio of the Number of Households That Were Ever Program Participants Over the Year to the Number of Program Participants in the Initial Time Period		Average Rate of Exit from the Program	
	Month	Wave	Month	Wave
One or More Programs	1.24	1.14	2.52	1.97
OASDI	1.07	1.05	0.31	0.27
UI	2.58	1.75	24.59	13.88
Medicare	1.05	1.05	0.22	0.27
AFDC+	1.38	1.26	3.37	2.83
SSI	1.21	1.17	1.06	1.05
FSP	1.37	1.20	4.36	3.56
WIC	1.88	1.53	6.56	5.38
Medicaid	1.26	1.22	2.48	2.43
Housing Assistance	1.10	1.10	0.80	0.89
LIHEAP	4.06	4.06	12.16	15.70
Two or More Programs	1.19	1.11	1.65	1.25
Sample Size (Thousands)	40,304			

SOURCE: 1984 SIPP Preliminary Longitudinal Research File.

NOTE: Program participant households include all households that were participating in any of the programs studied at any time during the year.

program to the number of households that participated in the initial period--are, in general, higher under the monthly time unit. The turnover rates for three programs--UI, the FSP, and WIC--are all over 10 percent higher under the monthly time unit than under the four-month time unit.

Measures of the average rate of exit over the year from the programs that are based on the different time units are also subject to large differences.[14] Average exit rates are over 10 percent greater under the monthly time unit for all programs except SSI, Medicaid, housing assistance, and LIHEAP.[15] For the majority of programs, the four-month time unit masks quick movements off and on the programs that occur between the months within the wave.

Several factors should be considered as we interpret the transition patterns for households participating in LIHEAP. The information in SIPP on participation in LIHEAP, while gathered in each wave, was not sought for the individual months within each wave. Thus, the transitions that are observed under the monthly time unit reflect the assumptions made to construct the monthly household measures, rather than the actual transitions reported by the respondents. For households that moved during the course of the survey and reported a change in LIHEAP receipt between the waves before and after the

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[14]The average exit rate based the monthly time unit is calculated as the ratio of the sum of all exits in each of the Months 2-12 to the sum of all participants in each of the Months 1-11. The average exit rate based on the four-month time unit is calculated as one-fourth of the ratio of the sum of all exits in each of the Waves 2-3 to the sum of all participants in each of the Waves 1-2 (i.e., we assume that the exits observed under the four-month time unit are disbursed evenly across the months).

[15]Unlike the measures of initial program status and the percentage of households undergoing program transitions, there are no straightforward tests of the significance of the differences for program turnover rates and average exit rates under the two time units.

move, it was assumed that the month of the change in LIHEAP receipt coincided with the month of the change of address. The frequent transitions in LIHEAP reflect the seasonal nature of the benefits provided under the program--winter heating and summer cooling assistance.

As shown in Tables 2 and 3, it is clear that, despite the tendency of respondents to report transitions as occurring at the seams of the survey, for a number of programs the four-month time unit does not capture the relatively frequent transitions in program participation that occur between the months that are internal to the survey wave. Consequently, the four-month time unit understates the scope of transitions in participation that are occurring over the course of the year for many of the programs. While this would suggest that the monthly time unit should be used to analyze changes in participation in many programs over time, the differences across programs in the extent to which transitions are reported to occur at the survey seam raise concern about using the monthly time unit to analyze serial multiple program participation. To the extent that any bias in the timing of transitions varies across the programs, so that the timing of transitions are reported more accurately for some programs than they are for others, monthly measures of multiple program participation may (1) overstate the frequency of changes in some program combinations over time, indicating greater sequencing in entry and exit for those programs than did actually occur, and (2) understate the frequency of changes in other program combinations, indicating less sequencing in entry and exit for those programs than did actually occur. Without a better understanding of the differences across programs in the biases associated with the timing of transitions, it is not possible to determine whether the patterns of multiple program participation observed in SIPP are a true reflection of

sequential program entry and exit. This differential bias notwithstanding, it is clear that the four-month time unit will mask any true intra-wave sequential entry and exit and, consequently, will overstate the scope and stability of multiple program participation over time, since the programs in which the household participates at any point during the four months are included in the multiple program combination for the entire four-month period.

C. PART-YEAR HOUSEHOLDS

By using households as the unit of analysis, we can address some questions that cannot adequately be answered by using the individual as the unit of analysis. Examples of such questions include:

- What is the extent of turnover in the Food Stamp caseload and what are the implications for caseload management?
- How is the decision to participate in multiple assistance programs, involving different group of individuals within the household, arrived at by the members of the household?

However, using the household as the unit of analysis in longitudinal studies creates analytic problems, since households change composition, form, and dissolve over time. In order to analyze the behavior of household over time, one must determine what constitutes a household that continues over time, a household that dissolves, and a household that is newly formed. Because no established standard for such decisions exists, relatively arbitrary assumptions must be made to define the longitudinal household. Such definitions yield a group of households that exist only for part of the time unit (which, for this study, is one year).

Two problems arise with these part-year households. First, since not all the households exist for the full time period, standard summary measures of

the longitudinal behavior of the households (e.g., number of program transitions) are problematic, since they do not adjust for the differences in the time period over which the transitions are observed. Alternative methods for addressing this problem have been proposed (e.g., focusing on full-year households, and time weighting part-year households), but little work has been done to evaluate the implications of the different approaches.[16]

In this study, we explore the impact of alternative treatments of part-year households on the profile of serial program participation using the same measures of program participation as we used to analyze the appropriate time unit. Also, as was the case in the previous section, we focus on the patterns of program participation for those households that participate in at least one program over the survey time period.

Since part-year households are, by definition, observed for less than the full time period, they are less likely to be observed in a particular state (e.g., program participation) over a fixed time period than are full-period households, all else equal. Thus, in interpreting the patterns of program participation that are observed, it should be noted that they represent the behavior of all program participant households that existed over a year, and not the behavior of all such households for a year.

The second problem associated with part-year households is more substantive. One criticism of using households as the unit of analysis in longitudinal work has been that information on the antecedent household is ignored when a new household forms. This can have serious implications for

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[16]Citro et al. (1987) is one of the few exceptions. As part of a study of longitudinal household concepts in SIPP and the implications of those definitions on measures of annual income status, Citro et al. discuss the difficulties associated with part-year households.

analyzing serial program participation. For example, when a new household forms from an existing household that is participating in a particular program, and the new household also participates in that program, the standard approach has been to view the new household as beginning a new spell of program participation.[17] By treating the new household as independent from its antecedent household(s), we lose important information on the previous history of the program participants, and, some argue, we artificially censor the spells of program participation. In order to address this problem, we will link information on the program participation of newly formed households with similar information for their antecedent household. Using this information, we will explore the extent to which the longitudinal household unit definition introduces artificial program entry into the profile of serial program participation.[18] This exploration will involve comparisons of the program participation status of the newly formed household in its first month of existence with that of its antecedent household in the prior month.

1. Number of Part-Year Households

About 92 million households existed over the twelve-month period of the longitudinal file. Of those households, 45.6 million participated in at least one of the twelve programs included in this study at some point over the year, as reported in Table 4. Of the program participant households, 88 percent

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[17]It should be noted that the antecedent household(s) of a newly formed household may or may not dissolve when the new household is formed. An example of the latter is the formation of a new household by a child who moves out of an existing household to set up his/her own household. The parental household continues to exist after the departure of the child.

[18]The related issue--the extent to which the dissolution of an existing household as a new household forms leads to artificial program exits--is not addressed in this report.

Table of Contents

TABLE 4

THE NUMBER OF HOUSEHOLDS CONTINUING, DISSOLVING, AND FORMING OVER THE YEAR FOR ALL PROGRAM PARTICIPANT HOUSEHOLDS, 1983/1984
(Weighted)

Month	Number of Households Existing in Each Month (Thousands)	Number of Existing Households Dissolving in Each Month[a] (Thousands)	Number of New Households Forming in Each Month[b] (Thousands)	Percentage of Households Existing in Each of the Months That Are: Full-Year Households	Part-Year Households
1	43,175	0	---	93.3	6.7
2	43,175	0	0	93.3	6.7
3	43,175	0	0	93.3	6.7
4	43,175	505	0	93.3	6.7
5	42,902	296	232	93.8	6.2
6	42,956	262	350	93.7	6.3
7	42,995	305	302	93.6	6.4
8	42,928	729	237	93.8	6.2
9	42,601	329	402	94.5	5.5
10	42,577	384	306	94.6	5.4
11	42,503	431	309	94.7	5.3
12	42,336	---	264	95.1	4.9
Total for Year	45,577	3,241	2,402	88.3	11.7

SOURCE: 1984 SIPP Preliminary Longitudinal Research File.

NOTES: Under the SIPP survey design, household composition is assumed to be constant across all months in Wave 1 (Months 1-4). Program participant households include all households that were participating in any of the programs studied at any time during the year.

[a]A household is defined as having dissolved in a particular month if it existed in that month but did not exist in the following month.

[b]A household is defined as having formed in a particular month if it existed in that month but did not exist in the previous month.

were full-year households, existing for all twelve months, and 12 percent were part-year households, forming or dissolving over the course of the year.[19] Clearly, part-year households represent an important component of the program participant households that exist over the course of the year.[20]

Within an individual month, the share of part-year households was smaller, ranging from about 5 to 7 percent of the program participant households in existence during that month. Consistent with the tendency of survey respondents to report transitions in program income receipt at the seams of the survey, household transitions also tended to occur more frequently at the seams than between pairs of months internal to a survey wave. This tendency is shown most clearly in Table 5, which presents the distribution of part-year households by the number of months for which they were observed to exist.[21] The percentage of part-year households that exist for periods that are multiples of four months (i.e., 4 months or 8 months) are from 5 to 12 percentage points greater than those reported to exist for other time periods.

This tendency of household transitions to occur at the seams of the survey will exacerbate the seam problem that was examined in the previous section with respect to program transitions. Since program transitions are frequently assumed to coincide with the dissolution and formation of the household (e.g., the dissolution of a household is assumed to lead to an exit

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[19]Under the SIPP survey design, changes in household composition are not measured for Wave 1 (Months 1-4).

[20]Since it is likely that SIPP undercounts part-year households (see Section A), such households probably represent an even greater component of the program participant households that exist over the course of the year.

[21]It should be noted that, because household composition was assumed to be constant for all months in Wave 1, households that formed during the course of the year would be observed for 8 months at most.

Table of Contents

TABLE 5

THE LENGTH OF TIME THAT PART-YEAR HOUSEHOLDS ARE OBSERVED TO EXIST FOR ALL PROGRAM PARTICIPANT HOUSEHOLDS, 1983/1984 (Weighted)

Number of Months	Number of Households by Months of Existence (Thousands)	Percentage Distribution of Part-Year Households by the Number of Months of Existence
1	399	7.6
2	347	6.6
3	377	7.2
4	918	17.4
5	482	9.1
6	478	9.1
7	519	9.8
8	806	15.3
9	244	4.6
10	329	6.2
11	373	7.1
Total Sample	5,272	100.0

SOURCE: 1984 SIPP Preliminary Longitudinal Research File.

NOTE: Program participant households include all households that were participating in any of the programs studied at any time during the year.

from program participation), it is likely that program transitions for part-year households will have an even greater proclivity toward the seam than is true of full-year households.

2. Methods for Including Part-Year Households in the Analysis

Very little work has been undertaken on the alternative approaches for incorporating part-year households into an analysis of household behavior. Citro et al. (1987) is the only study that we are aware of that focuses on the difficulties associated with such households. In this section, we compare the profiles of serial program participation obtained in three frameworks: (1) analyzing part-year and full-year households separately, (2) analyzing all households, ignoring the length of time over which the households exist, and (3) analyzing time-weighted households, where time-weighted households are constructed by weighting each household by the proportion of the year that it existed.

This analysis uses the monthly time unit and, as noted above, is limited to the sample of households that were program participants at some point during the year.

The length of time over which the part-year households exist has important implications for the patterns of program participation that are observed. Program participant households that are followed for shorter periods of time are both more likely to be program participants in the initial period (since they must be program participants in order to be included in the analysis sample) and less likely to experience transitions in program participation (other than transitions due to the dissolution of the household) than are program participant households that are observed for the full time period,

all else equal.[22] Thus, as shown in Table 6, it is not surprising that part-year program participant households are more likely than the full-year households to be participating in one or more programs in the initial month.[23] However, because the number of part-year households is small relative to the number of full-year households, the differences in the participation rates in the initial month have little impact on the program participation rates for the combined sample or for the time-weighted sample. The profile of program participation in the initial month is essentially the same for full-year households, all households, and time-weighted households.

Unlike program participation at a point in time, the profile of participation over time is quite sensitive to the inclusion of the part-year households, as shown in Table 7. The differences between the part-year and full-year households in terms of the percentage of households that undergo one or more transitions in program participation reflect two factors. First, as noted earlier, the shorter time period over which the part-year households are observed makes it less likely that those households will exit the program (independent of an exit by household dissolution) than is true of full-year households, all else equal. Second, and most important for this table, under the standard approach for measuring transitions in program participation for households, households, the dissolution of a household leads to the end of a spell of program participation. Consequently, with over 60 percent of the

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[22] In addition to the impact of the shorter observation period, it is likely that the differences in program participation between the part-year and full-year households also reflect some differences in program eligibility and program participation decision-making. Although this issue is not addressed directly in this report, Appendix Table A.2 indicates that part-year households, on average, are smaller and less well-off financially than are the

Table of Contents

TABLE 6

COMPARISON OF PROGRAM PARTICIPATION STATUS OF PROGRAM PARTICIPANT HOUSEHOLDS IN THE INITIAL MONTH UNDER DIFFERENT TREATMENTS OF PART-YEAR HOUSEHOLDS, USING THE MONTHLY TIME UNIT, 1983/1984
(Weighted)

	Percentage of Houseolds That Are Program Participants in the Initial Month			
Program	Part-Year Households	Full-Year Households	All Households	Time-Weighted Households
One or More Programs	86.4	80.6	81.3	80.7
OASDI	45.3	54.1	53.1	53.5
UI	8.8	7.5	7.6	7.5
Medicare	39.6	49.0	47.9	48.4
AFDC+	14.4	8.5	9.2	8.8
SSI	7.1	6.6	6.6	6.6
FSP	21.9	14.7	15.5	15.0
WIC	5.1	2.4	2.7	2.6
Medicaid	25.4	17.4	18.3	17.8
Housing Assistance	10.2	8.6	8.8	8.6
LIHEAP	7.0	3.3	3.8	3.5
Two or More Programs	61.7	61.0	61.1	60.9
Sample Size (Thousands)	5,273	40,304	45,577	42,875

SOURCE: 1984 SIPP Preliminary Longitudinal Research File.

NOTE: Program participant households include all households that were participating in any of the programs studied at any time during the year.

Table of Contents

TABLE 7

COMPARISON OF THE PERCENTAGE OF HOUSEHOLDS WITH PROGRAM TRANSITIONS FOR PROGRAM PARTICIPANT HOUSEHOLDS UNDER DIFFERENT TREATMENTS OF PART-YEAR HOUSEHOLDS, USING THE MONTHLY TIME UNIT, 1983/1984
(Weighted)

Program	Percentage of Households with One or More Transitions in Program Participation for Program Participants in the Initial Month			
	Part-Year Households	Full-Year Households	All Households	Time-Weighted Households
One or More Programs	63.5	12.7	19.0	16.6
OASDI	64.5	2.3	8.5	6.0
UI	79.7	96.2	94.0	95.6
Medicare	66.2	2.0	8.1	5.6
AFDC+	61.4	23.1	30.1	27.6
SSI	66.8	8.4	15.6	12.7
FSP	63.2	27.3	33.2	31.2
WIC	63.8	47.7	51.1	51.3
Medicaid	61.2	18.4	25.3	22.9
Housing Assistance	58.7	7.4	14.3	11.7
LIHEAP	72.9	85.8	83.1	85.6
Two or More Programs	64.9	7.5	14.2	16.6
Sample Size (Thousands)	5,273	40,304	45,577	42,875

SOURCE: 1984 SIPP Preliminary Longitudinal Research File.

NOTE: *Program participant households include all households that were participating* in any of the programs studied at any time during the year.

part-year households dissolving during the course of the year (see Table 3), the percentage of part-year households that undergo at least one transition is significantly greater than the percentage observed for the full-year households for nearly all of the programs.[24] The two exceptions--UI and LIHEAP--are the programs in which the likelihood of transitions is the greatest (based on the findings for the full-year households) and, therefore, are those that are most likely to be affected by the shorter observation period for part-year households.

The impact of the shorter observation period for part-year households is shown more clearly in Table 8, which reports rates of turnover in the programs. Since these rates are based on the total number of participants over the year (relative to the number of participants in the initial period), we would expect that the turnover rates would be lower for those households that are followed for less than a year, all else equal. This expectation is supported by the table; the largest differences between part-year and full-year households are observed for those programs that are subject to the greatest turnover--UI and LIHEAP.

Comparing the frequency of transitions (Table 7), program turnover rates[25] (Table 8), and average program exit rates (Table 9) for full-year households, all households, and time-weighted households clearly shows that the time-weighting provides a balance to the two alternative approaches. With

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[24]Appendix Table A.3 reports the results of the test of differences in the proportions of households with transitions in program participation for the part-year households, full-year households, all households, and the time-weighted households.

[25]Note that these program turnover rates are based on participation in the households initial month of existence and not, as is frequently used for measures of administrative turnover, participation in a typical month.

Table of Contents

TABLE 8

COMPARISON OF PROGRAM TURNOVER RATES FOR
PROGRAM PARTICIPANT HOUSEHOLDS UNDER DIFFERENT TREATMENTS
OF PART-YEAR HOUSEHOLDS, USING THE MONTHLY TIME UNIT, 1983/1984
(Weighted)

	Ratio of the Number of Households That Were Ever Program Participants Over the Year to Program Participants in Initial Month			
Program	Part-Year Households	Full-Year Households	All Households	Time-Weighted Households
One or More Programs	1.16	1.24	1.23	1.24
OASDI	1.05	1.07	1.07	1.07
UI	1.79	2.58	2.48	2.56
Medicare	1.01	1.05	1.05	1.05
AFDC+	1.22	1.38	1.34	1.36
SSI	1.18	1.21	1.21	1.21
FSP	1.36	1.37	1.37	1.38
WIC	1.32	1.88	1.78	1.80
Medicaid	1.21	1.26	1.26	1.26
Housing Assistance	1.04	1.10	1.08	1.10
LIHEAP	1.60	4.06	3.50	3.85
Two or More Programs	1.12	1.19	1.19	1.19
Sample Size (Thousands)	5,273	40,304	45,577	42,875

SOURCE: 1984 SIPP Preliminary Longitudinal Research File.

NOTES: Program participant households include all households that were participating in any of the programs studied at any time during the year. The program turnover rates reported here do not correspond to measures of administrative turnover since these measures are based on participation status as of the first month in which the household exists.

Table of Contents

TABLE 9

COMPARISON OF AVERAGE PROGRAM EXIT RATES OVER THE YEAR FOR PROGRAM PARTICIPANT HOUSEHOLDS UNDER DIFFERENT TREATMENTS OF PART-YEAR HOUSEHOLDS, USING THE MONTHLY TIME UNIT, 1983/1984 (Weighted)

	Average Rate of Exit from the Program Over the Year			
Program	Part-Year Households	Full-Year Households	All Households	Time-Weighted Households
One or More Programs	16.00	2.52	3.36	3.02
OASDI	12.43	0.31	0.94	0.68
UI	32.34	24.59	25.18	24.92
Medicare	12.09	0.22	0.81	0.56
AFDC+	17.19	3.37	4.55	4.06
SSI	15.87	1.06	1.98	1.59
FSP	18.36	4.36	5.54	5.04
WIC	15.82	6.56	7.48	7.11
Medicaid	15.52	2.48	3.53	3.10
Housing Assistance	11.48	0.80	1.53	1.22
LIHEAP	21.57	12.16	12.87	12.54
Two or More Programs	13.93	1.65	2.36	2.06
Sample Size (Thousands)	5,273	40,304	45,577	42,875

SOURCE: 1984 SIPP Preliminary Longitudinal Research File.

NOTE: Program participant households include all households that were participating in any of the 12 programs studied at any time during the year.

the analyses of full-year households and all households providing the two extremes in the treatment of part-year households--ignoring the part-year households and weighting part-year and full-year households equally--time-weighting provides a middle ground by adjusting the profile of program participation for the length of time during which the households exist.

The time-weighting of part-year households is a relatively simple approach for incorporating part-year households into the analytic framework. In the next section, we consider a more complex approach to treating part-year households.

3. Incorporating Information on Antecedent Households in the Analysis

One criticism of using households (or other group of individuals) in longitudinal studies is that the information on the antecedent households is typically ignored when newly formed households are analyzed. That is, when a new household is formed either as an off-shoot of a continuing household or because a household has dissolved, the standard approach is to view the newly formed household as beginning a new spell of program participation. Furthermore, when the newly formed household is due to the dissolution of the antecedent household, the antecedent household is frequently viewed as having ended a spell of program participation. Since the longitudinal household definition does not necessarily coincide with the definition of an assistance unit under a program, the household-level analysis may provide a very different profile of serial participation for a given program than is indicated by administrative records.

For example, as a result of the failure to consider information on the antecedent household, the household-level analysis may treat a newly formed household as if it were a new program participant when, in actuality, the

program unit has not changed. Under the Census Bureau's definition of a longitudinal household, one case where this would occur is if a married-couple household, one member of which receives Social Security benefits, dissolved and each individual formed a new household. In the pattern of program participation observed for these households over time, one spell of Social Security receipt would be viewed as ending with the dissolution of the initial household and a new spell as having begun for the newly formed household that contains the Social Security recipient. Yet, from the perspective of the Social Security program, a single, ongoing spell of program participation is occurring. The program entry that is observed in the household-level analysis of Social Security participation is an artifact of the longitudinal household definition that is used.

In this section, we examine the extent to which changes in program participation status occur simultaneously with changes in the formation of new household units under the Census Bureau's longitudinal household definition. The extent of continuity provides an upper-bound estimate of the extent to which the longitudinal household definition introduces artificial entry in the program participation measures from the perspective of program administration.

Developing the Analysis File. This analysis required that we link the record of each newly formed household with the record of its antecedent household and compare program participation in the first month in which the new household existed with the program participation of the antecedent household in the prior month. The antecedent households of a newly formed household are defined as the previous households of all members of the new household. If all of the members of the newly formed household belonged to the same household unit in the prior month, then the newly formed household

would have a single antecedent household. However, if the members of the newly formed household were members of different households in the prior month, then the newly formed household would have multiple antecedent households. In the file used for this study, this situation occurs when an original household breaks up into multiple new households, and then, at a later date, members from one or more of those new households reunite to form another new household.[26]

The longitudinal sample contained 40 (unweighted) newly formed households with two antecedent households out of a total unweighted count of 1,453 newly formed households with at least one antecedent household. For the majority of these households, the program participation pattern in the prior month was identical for both antecedent units. For the three cases in which the program participation pattern of the antecedent households differed in the prior month, we used the program participation pattern of the older antecedent household.[27]

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[26]Due to factors associated with how the Census Bureau defines a longitudinal household and how the longitudinal sample is defined in SIPP, several technical problems arose in creating this linked file. Most notably, some newly formed households in the longitudinal sample did not have antecedent households. This was the case when individuals in the longitudinal sample (and, hence, who were assigned a positive longitudinal weight) were excluded by the Census Bureau from the sample of longitudinal households. In general, individuals were excluded when the dwelling unit of the antecedent household was headed by a new sample member or by an original sample member who was assigned a zero longitudinal weight due to sample attrition (i.e., the household head was not included in the longitudinal sample). However, individuals were also excluded when the dwelling unit consisted exclusively of individuals who were included in the longitudinal sample. We omitted from this analysis the newly formed households that did not have antecedent households.

[27]Because of the manner in which the longitudinal units were identified and sorted in the file, the first unit encountered was the one that was formed earlier in the reference period. In the event that both antecedent units were formed at the same time, we used the first unit encountered--the unit with the lowest value for the address identifier--for the comparison.

Comparison of Newly Formed Households and Antecedent Households.

Table 10 compares the program participation status of the newly formed households in their first month of existence with that of their antecedent household in the prior month. As shown in the table, the proportion of newly formed households that are participating in a program during their first month who are descended from a household that was participating in that program in the prior month ranged from 53 percent for housing assistance to over 95 percent for both OASDI and Medicare. Thus, for all of the programs, significant shares of the newly formed program participant households potentially encompass a program unit that existed in the antecedent household, and are not, as the standard household-level analysis would indicate, beginning a new spell of benefit receipt. However, as noted earlier, this is an upper-bound estimate on the volume of continuous spells of program participation that are masked by the Census Bureau's definition of a longitudinal household. For some component of these households, it is likely that the changes in household composition that led to a newly formed household coincided with the formation of a new program assistance unit.

The degree of potential continuity in the program assistance unit as household structure changes varies substantially across programs. Not surprisingly, two of the programs that are targeted toward individuals and/or couples not on the basis of need (e.g., OASDI and Medicare) exhibit the greatest continuity in participation from the antecedent household to the newly formed household. For households that participate in these programs, the formation of a new household is frequently caused by the death of one spouse in a married-couple household, with the surviving spouse continuing to receive benefits under the program. Under the Census Bureau's definition of a

Table of Contents

TABLE 10

COMPARISON OF PROGRAM PARTICIPATION BY NEWLY FORMED HOUSEHOLDS IN THEIR INITIAL MONTH WITH THE PROGRAM PARTICIPATION OF THEIR ANTECEDENT HOUSEHOLD IN THE PRIOR MONTH, 1983/1984
(Weighted)

Program	Number of Newly Formed Households Participating in Their Initial Month (Thousands)	Proportion with Antecedent Households Participating in the Prior Month
One or More Programs	2,140	88.5
OASDI	961	95.5
UI	223	50.3
Medicare	761	95.9
AFDC+	419	79.7
SSI	160	74.7
FSP	612	78.8
WIC	118	80.8
Medicaid	677	79.1
Housing Assistance	268	53.2
LIHEAP	243	58.7
Multiple Program Combination	2,140	51.7
Sample Size	6,072	

SOURCE: 1984 SIPP Preliminary Longitudinal Research File.

NOTES: The newly formed households include all households that formed after Month 5, excluding those households for which there were no antecedent households in the longitudinal sample. It should be noted that, by definition, household composition does not change in Months 1-4 of SIPP.

longitudinal household, a new household is formed following the death of the spouse, leading to the end of spells of participation in Social Security and Medicare for the dissolving household and the beginning of new spells for the newly formed household. In cases where the surviving spouse is a primary beneficiary under the programs, the longitudinal household definition generates artificial turnover in the programs.

The remaining program in Table 10 that is targeted toward individuals not on the basis of need is UI. Unlike OASDI and Medicare, the potential continuity of participation as household structure changes appears to be much less likely under UI. It is likely that this lack of continuity in participation reflects the high level of turnover in UI participation over the year (see Table 8). With relatively high turnover, it is likely that the beginning and of spells of UI participation would frequently coincide with the changes in household structure.

The other program observed to have a relatively high turnover rate over the year--LIHEAP--also shows little potential continuity in participation from the antecedent household to the newly formed household. It would appear that LIHEAP and UI are less likely to be subject to the introduction of artificial turnover under the definition of a longitudinal household than are programs with more stable participation.

An exception to the apparent relationship between turnover and potential continuity pertains to participation in housing assistance. Although the turnover rates observed for participation in housing assistance are quite low, a relatively low level of continuity in participation occurs as household structure changes. This finding may reflect the frequency with which new households form at an address that differs from the address of the antecedent

household and, by definition, initiate a new spell of housing assistance at that new address.

The proportion of newly formed households that could potentially be in the midst of continuing spells of program participation is approximately 80 percent for each of the remaining programs--AFDC+, SSI, the FSP, and WIC. Except for SSI, where the program unit for administrative purposes is the individual, the effect of the use of the Census definition of continuity in estimates of program turnover is of the most concern for these programs. In the cases of PA and WIC, for example, the program unit may be a subset of the household and may not contain the household reference person or spouse on which the Census Bureau bases continuity. Furthermore, the program unit may remain intact as the larger household changes composition. For the FSP, instances where the program unit is artificially dissolved occur when the applicant for food stamps is and remains to be a principal person in the household under the Census Bureau's definition, but that person's marital status changes. In such cases, the FSP will consider the program unit to continue but the Census longitudinal unit definition will dissolve one unit and form another.

When the programs are viewed in combination, the proportion of newly formed households which potentially represent a continuous spell of multiple program participation drops to 52 percent. In other words, just over half of the newly formed households with at least one benefit type participate in exactly the same combination of benefits as their antecedent unit. Among the remaining newly formed program participant households, about one-fourth represent true new spells, i.e., the antecedent unit did not receive in any of

the benefits analyzed here, while the remaining households participated in a different combination of programs than did their antecedent unit.

The upper bound estimates of potential continuity in the program units when households form under the Census Bureau's longitudinal household definition are quite high. However, the magnitude is somewhat misleading because the base of the percentages (i.e., newly formed households participating in a particular program or program combination) ignores the instances when the antecedent unit participated in a particular program but the new unit does not.[28] While a different study design is required to address this issue fully (in particular, we need to examine household households which dissolve based on characteristics of decedent units) we can illustrate the number of newly formed units which do not participate in the same program as did their antecedent units. These figures are presented in Table 11. In all instances there are a substantial number of new units who clearly do not represent a continuous spell of program participation from their prior household. If these units had continued participating in the same programs the size of the participant population would have increased dramatically over that which is observed in the initial month. In the case of SSI, for example, there would have been almost twice as many participants among newly formed households as were actually observed to occur. At the other extreme, only a small number of newly formed households which descended from participants in housing programs did not continue to receive housing benefits. However, for more than half of the programs studied, the size of the caseload would have increased by 150

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[28]This can not be described as a program exit per se because the antecedent unit can continue to exist and continue participation even as the new unit is formed.

Table of Contents

TABLE 11

AN ILLUSTRATION OF THE POTENTIAL EFFECT OF NEWLY FORMED HOUSEHOLDS CONTINUING THE PARTICIPATION PATTERNS OF THEIR ANTECEDENT HOUSEHOLD
(Weighted)

Program	Number of Newly Formed Households Participating in Initial Month (Thousands)	Number of Antecedent Households Participating in Prior Month When Newly Formed Households Does Not Participate	Potential Increase in Caseload
OASDI	961	461	1.48
UI	223	156	1.70
Medicare	761	374	1.49
AFDC+	419	227	1.54
SSI	160	145	1.91
FSP	612	271	1.44
WIC	118	75	1.64
Medicaid	677	333	1.49
Housing Assistance	268	29	1.11
LIHEAP	243	105	1.43
Multiple Program Combination	2,140	731	1.34
Sample Size	6,072		

SOURCE: 1984 SIPP Preliminary Longitudinal Research File.

NOTES: The newly formed households include all households that formed after Month 5, excluding those households for which there were no antecedent households in the longitudinal sample. Note that by definition household composition does no change in Months 1-4 of SIPP.

percent or more had the newly formed unit continued receiving the same benefits as the antecedent unit.

D. SUMMARY AND RECOMMENDATIONS

Although SIPP has enormous potential for analyzing patterns of multiple program participation over time, a number of complex methodological issues associated with analyzing longitudinal data must be resolved. In this study, we have used the 1984 SIPP Preliminary Longitudinal Research File to address two such issues: (1) the appropriate time unit for using SIPP to analyze program transitions, and (2) alternative methods to account for part-year households in analyzing serial program participation.

1. Appropriate Time Unit

In addressing the first issue, we compared the profile of serial program participation obtained when using the monthly SIPP data with the profile obtained under the four-month wave period, to determine whether the bias in the timing of reported transitions toward the seam of the survey leads to equivalent profiles under the two time units. Equivalent profiles of serial program participation would be evidence that there is no additional information to be gained from the 1-month time unit over that contained in the four-month unit.

Our findings suggest that, for a number of programs, significant turnover between months that are internal to the survey wave is not captured by the four-month time unit. Consequently, information on serial program participation available from SIPP is lost when the analysis utilizes the longer time unit. In particular, the four-month time unit will overstate the scope and stability of serial multiple program participation relative to the monthly

time unit since any program in which the household participates at any point during the four months is included in the multiple program combination for the four-month period.

Unfortunately, there is evidence from other studies that the bias in the timing of transitions in program participation differs across assistance programs so that an analysis of serial multiple program participation that relies on the monthly time unit is likely to misrepresent, to some extent at least, the patterns of serial multiple program participation experienced by the household over the year.[29] Based on these findings we suggest that care be taken in the use of the monthly time unit for the analysis of serial multiple program participation. Nevertheless, the existence of true intra-wave transitions in SIPP and the importance of the monthly time unit to program administration suggests that the abandonment of the monthly time unit for analyses of program participation using SIPP is not warranted. That is, we believe that the month-based measures of serial multiple program participation available in SIPP, even with potential inaccuracies due to biases in the timing of transitions, capture important information that is missed under the four-month time unit.

We recommend that research on serial multiple program participation move forward using the monthly time unit, with the clear acknowledgement by the analyst of the limitations of the data. We also recommend that additional research be undertaken comparing the information on multiple program

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[29]Preliminary findings from a study being funded by the Census Bureau (Young, forthcoming) suggest that this differential bias may be less severe than was indicated by earlier work. Furthermore, the Census Bureau has modified the SIPP questionnaires to improve the quality of the information on the reported timing of transitions in future waves of SIPP.

transitions reported in SIPP to that found in administrative records. By comparing the nature of any bias in the timing of transitions across the programs, a better understanding of the reliability of the information in SIPP on sequential program entry and exit would be obtained.

2. Part-Year Households

Our analysis of the treatment of part-year households in a longitudinal analysis deals with two associated problems.

Counting Part-Year Households. Since all of the households do not exist for the full time period, standard summary measures of household behavior over

[redacted]

in the length of time over which behavior is observed. In order to explore the impact of part-year households on the analysis of serial program participation, we compared several alternative methods for incorporating part-year households into a longitudinal analysis. The methods considered included:

1. Treating full-year and part-year program participant households separately
2. Analyzing all program participant households without regard to the length of time over which they exist, and
3. Using time-weighted program participant households.

weighting, by adjusting the measures of serial program participation for the length of time that the households exist, provides a middle ground between approaches that ignore part-year households and those that weight part-year and full-year households equally. We strongly recommend that part-year households be included in any analysis of serial multiple program participation and that time-weighting be used to adjust for differences in the period over which the households are observed.

Prior History of Newly-Formed Households. The second problem associated with part-year households arises in the context of the longitudinal household definition. One criticism of the household as the unit of analysis in longitudinal studies is that information on the antecedent household is ignored when a new household forms. The standard analytic approach is to assume that the beginning/ending of spells of program participation coincide with the formation/dissolution of the household. Since program assistance units do not necessarily correspond to the longitudinal household, the household-level analysis may indicate greater turnover in program participation than is supported by administrative records. In comparing program participation status across the newly formed households and their antecedent households, we explored the extent to which the Census Bureau's longitudinal household definition potentially introduces artificial program entry into the profile of serial program participation.

Although our work suggests that there may be a great deal of continuity in program participation as households dissolve and form, additional work is needed to determine more clearly the relationship between the longitudinal household definition and the definitions of the program units. Until that work is completed, care should taken in using the findings from a household-

based analysis of serial program participation as an approximation to participation over time from the perspective of program administration.

Finally, to the extent that the questions that are being addressed permit, we recommend that alternative units of observation that do not suffer from the difficulties associated with the longitudinal household unit be considered (e.g., individuals or individuals with family and household characteristics incorporated as attributes of the individual).[30]

3. Recommendations

In summary, we make the following recommendations with respect to future substantive research on serial multiple program participation and future methodological research:

- Future Substantive Research
  - SIPP-based research on serial multiple program participation should move forward using the monthly time unit, with the limitations of the SIPP data clearly noted by the analyst.
  - Household-based analyses of serial multiple program participation should incorporate both full-year and part-year households, with time-weighting used to adjust for the differences in the time periods for which households are observed.
  - If the particular research questions that are being addressed permit, units of observation that do not generate part-period units (e.g., individuals or individuals with the family or household characteristics incorporated as attributes of the individual) should be utilized.

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[30] Doyle and Long (1988) examine the impact of the unit of analysis on measures of serial multiple program participation.

- Future Methodological Research

  - Research is needed to determine the sensitivity of measures of serial multiple program participation (particularly, measures of sequential program entry and exit) to differences in the biases in the timing of transitions in program participation across the assistance programs.

  - As household-based measures of serial multiple program participation may be sensitive to the particular longitudinal household definition that is used, an important direction for future research will be the examination of the relationship between the Census Bureau's longitudinal household definition and the definition of the assistance unit under the different programs.

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Table of Contents

APPENDIX A

SUPPLEMENTAL TABLES

Table of Contents

TABLE A.1

SELECTED MEASURES OF PARTICIPATION IN THE NATIONAL SCHOOL LUNCH PROGRAM (NSLP) AND THE SCHOOL BREAKFAST PROGRAM (SBP) FOR FULL-YEAR PARTICIPANT HOUSEHOLDS, USING THE MONTHLY AND FOUR-MONTH TIME UNITS, 1983/1984
(Weighted)

	NSLP	SBP
Percent of Households That Are Program Participants in Initial Time Period		
Month	3.9	1.4
Wave	14.6	4.7
Percent of Ever-On Households With One or More Transitions in Program Participation		
Month	82.4	85.7
Wave	29.4	45.3
Ratio of Number of Households That Were Ever Program Participants Over the Year to the Number of Program Participants in the Initial Period		
Month	4.75	5.26
Wave	1.26	1.52
Average Rate of Exit from the Program		
Month	12.29	4.57
Wave	15.67	8.49
Sample Size (Thousands)	40,304	

SOURCE: 1984 SIPP Preliminary Research File

NOTE: Program participant households include all households that were participating in any of the programs studied at any time during the year.

Table of Contents

TABLE A.2

SELECTED HOUSEHOLD CHARACTERISTICS OF PROGRAM PARTICIPANT HOUSEHOLDS AS OF THE INITIAL MONTH UNDER DIFFERENT TREATMENTS OF PART-YEAR HOUSEHOLDS, USING THE ONE-MONTH TIME UNIT, 1983/1984
(Weighted)

Characteristics	Part-Year Households	Full-Year Households	All Households	Time-Weighted Households
Household Size (Mean)	2.32	2.67	2.63	2.65
Total Monthly Household Income Per Capita (Mean)	$596.28	$686.41	$675.98	$681.38
Ratio of Total Monthly Household Income to Monthly Poverty Threshold	2.00	2.49	2.43	2.47

SOURCE: 1984 SIPP Preliminary Longitudinal Research File.

NOTE: Program participant households include all households that were participating in any of the programs studied at any time during the year.

Table of Contents

TABLE A.3

TESTS OF SIGNIFICANCE FOR DIFFERENCES IN PROGRAM PARTICIPATION STATUS IN PROPORTION OF HOUSEHOLDS WITH PROGRAM TRANSITIONS OVER A YEAR UNDER DIFFERENT TREATMENTS OF PART-YEAR HOUSEHOLDS, USING THE MONTHLY TIME UNIT, 1983/1984
(Weighted)

	Test of the Difference in the Proportion of Households with Transitions in Program Participation (t-statistic)		
Program	Part-year Versus Full-year Households	Full-year Versus All Households	All Versus Time-Weighted Households
One or More Programs	41.80 **	-11.433 **	4.30 **
OASDI	66.77 **	-17.948 **	6.54 **
UI	-22.72 **	6.845 **	-5.20 **
Medicare	69.10 **	-18.316 **	6.78 **
AFDC+	27.54 **	-10.514 **	3.77 **
SSI	51.85 **	-14.646 **	5.78 **
FSP	24.91 **	-8.568 **	2.98 **
WIC	10.38 **	-4.598 **	-0.24 **
Medicaid	32.47 **	-11.101 **	3.83 **
Housing Assistance	48.05 **	-14.709 **	5.41 **
LIHEAP	-11.38 **	5.056 **	-4.91 **
Two or More Programs	52.39 **	-14.287 **	-4.49 **

SOURCE: 1984 SIPP Preliminary Longitudinal Research File.

NOTES: Program participant households include all households that were participating in any of the programs studied at any time during the year.

*(**) Significant at the α=.05 (α=.01) level, two-tailed test.